IOI03 Boundary

Farmer Don watches the fence that surrounds his N meter by N meter square, flat field (2 ≤ N ≤ 500,000). One fence corner is at the origin (0, 0) and the opposite corner is at (N, N); the sides of Farmer Don's fence are parallel to the X and Y axes.

Fence posts appear at all four corners and also at every meter along each side of the fence, for a total of 4×N fence posts. The fence posts are vertical and are considered to have no radius. Farmer Don wants to determine how many of his fence posts he can watch when he stands at a given location within his fence.

Farmer Don's field contains R (1 ≤ R ≤ 30,000) huge rocks that obscure his view of some fence posts, as he is not tall enough to look over any of these rocks. The base of each rock is a convex polygon with nonzero area whose vertices are at integer coordinates. The rocks stand completely vertical. Rocks do not overlap, do not touch other rocks, and do not touch Farmer Don or the fence. Farmer Don does not touch the fence, does not stand within a rock, and does not stand on a rock.

Given the size of Farmer Don's fence, the locations and shapes of the rocks within it, and the location where Farmer Don stands, compute the number of fence posts that Farmer Don can see. If a vertex of a rock lines up perfectly with a fence post from Farmer Don's location, he is not able to see that fence post.

Input:

- The first line of input contains two space-separated integers: N and R.
- The next line of input contains two space-separated integers that specify the X and Y coordinates of Farmer Don's location inside the fence.
- The rest of the input file describes the R rocks:
  - Rock i's description starts with a line containing a single integer p_i (3 ≤ p_i ≤ 20), the number of vertices in the rock's base.
  - Each of the next p_i lines contains a space-separated pair of integers that are the X and Y coordinates of a vertex. The vertices of a rock's base are distinct and given in counterclockwise order.

Example input:
100 1
60 50
5
70 40
75 40
80 40
80 50
70 60

Note that the base of rock 1 has three collinear vertices: (70,40), (75,40), and (80,40)
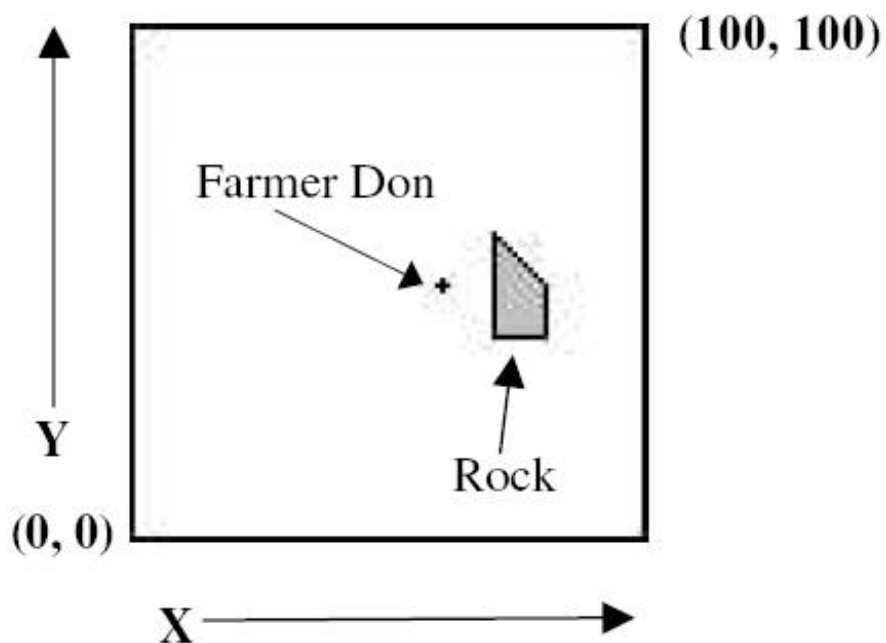
Output

The output should contain a single line with a single integer, the number of fence posts visible to Farmer Don.

Example output:
319

CONSTRAINTS

You will receive full points on each test case for which your program produces a correct output file. No partial credit will be given on any test case.